



INFORMATION SHEET

BUILDING SERVICES

Ref :BCA 20-11

How to Avoid Cracking in Concrete Paving

From time to time HIA's Building Services team receives member enquiries related to cracking in concrete paving and how it can be prevented from occurring and additional what steps can be undertaken to ensure cracking doesn't occur post construction.

Depending on the extent of the paving, this can be an expensive exercise to repair or replace and match the concrete driveways /paving where it is damaged.

In most cases, the main reason for cracking in concrete paving is that allowances for the shrinkage or general movement of the concrete have not been provided.

However, other factors can contribute to the cracking of the concrete, such as:

Adding additional water to the concrete mix prior to placement

- A concrete mix is made up of different proportions of cement, water, coarse and fine aggregates and admixtures. Different amounts of each of these ingredients will change the property of the final hardened concrete, adding extra water to a concrete mix that is designed for a specific slump can often cause reduced strength, cracking and/or dusting to the concrete.

Temperature and weather conditions

- Shrinkage cracks can occur when wind velocity, low relative humidity, high air temperature, or a combination of all three, cause water to evaporate from a concrete surface faster than it can be replaced by bleeding to the surface. The rapid evaporation that causes this cracking can be minimised by windbreaks, shading and efficient curing.
- Pouring concrete outside the recommended ambient temperatures of between 10°C and 30°C may cause shrinkage cracks, reduce concrete strength and cause crazing or cracking. If pouring outside these temperatures measures, heating or cooling the water or aggregate may need to be considered.

Concrete paving thickness

If the concrete paving is undersize (thickness) for the traffic that will be using it may also contribute to cracking. AS 3727 Guide to Residential Pavements recommends the following thickness for paving.

Traffic	Slab thickness
Foot and bicycle	75 mm
Light (cars)	100 mm
Medium	150 mm

DISCLAIMER - The above is intended to provide general information in summary form. The contents do not constitute specific advice and should not be relied upon as such. Formal specific advice should be sought by members with respect to particular matters before taking action.

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How to avoid cracking of concrete paving?

Below are some tips for assisting in avoiding cracking in concrete paving, including:

- Ensure adequate drainage of subgrade to reduce heaving under slab
- Ensure the subgrade is well compacted and at least 75mm thick
- By providing sufficient contraction joints. (usually 1/3rd of the thickness of the slab deep)
- Provide expansion joints adjoining structures, and where the driveways meet the footpath
- Reduce the evaporation of water from the concrete surface by providing windbreak, shading or efficient curing
- Start curing as soon as possible and maintain this for an adequate period
- Adjusting the concrete mixture pre delivery with additives to either slow or quicken the water evaporation time depending on weather and substrate under the concrete pour.

Curing of concrete

Curing is designed to keep the concrete moist, by preventing the loss of moisture from the concrete while it is gaining strength. There are a number of ways to cure concrete For example:

- Sprinkling the paving with water or cover with wet hessian, or
- Using damp straw, or
- Covering slab with damp sand, the sand must be kept moist, or
- Using Waterproof paper, or
- Plastic film

Other defects that can occur in concrete paving include:

- Blistering – Cracking – Curling - Delamination - Discolouration
- Dusting –Efflorescence - Low spots – Popouts Scaling and Mortar Flaking
- Spalling.

The elements included in this information sheets are not exhaustive and are recommendations to assist in avoiding cracking, but should be noted that they are not the only means that could be employed to avoid cracking.

For further information on efflorescence in masonry HIA members can contact HIA's Building services team 0n [1300 650 620](tel:1300650620) or hia_technical@hia.com.au